## 1. President's Foreword

Dear members and friends of the Society,

It is my pleasure to introduce you to the fourth Newsletter of the Society for Mathematics and Computation in Music. It was an excellent idea of our secretary, Elaine Chew, to postpone this letter until after the third biennial conference, held at Ircam in Paris in June 2011. With this distinguished conference event, concisely reviewed in this newsletter, we now have further evidence that our scientific, computational, and artistic concerns have received recognition among global opinion leaders in mathematics, computer science, music, and philosophy. When I started working in this field in 1978, nobody would have subscribed to such a future. And even in 1984, when Herbert von Karajan invited me to his Salzburg Easter Symposium on Music and Mathematics, the event was more an exotic singularity than a promise of scientific and artistic socialization.

Complementing the superb organization of the MCM conference in Paris, and my gratitude goes to its professional organizers, we also have two success stories regarding the Society's knowledge distribution, namely the Journal of Mathematics and Music (JMM), and the Springer series on Computational Music Science (CMS). In the name of our Society, I want to express my deep gratitude to Thomas Noll and Robert Peck for their exemplary work as co-editors of JMM. The increase in page count and a number of remarkable special issues have proven the very stable reality of this journal. Springer has now published three volumes under CMS, co-edited by Moreno Andreatta and Guerino Mazzola; a fourth volume will be published in November 2011. As you may infer from this Newsletter's paragraph on this series, Springer has plans for an impressive number of upcoming CMS books, and we encourage everybody to write for Springer, whose new Science Editor, Ronan Nugent, is a very encouraging and reliable partner.

Coming back to the last paragraph in my previous foreword, concerning applications of our theories, I am pleased that Anja Volk and Aline Honingh have responded to these concerns in organizing at Ircam the conference panel, "Bridging the Gap: Computational and Mathematical Approaches in Music Research," which will lead to both a JMM special issue and a CMS volume.

Summarizing our status quo, I understand that we are now accepted by opinion leaders, but we need more – acceptance in the schools of mathematics, computer science, and music. The perspectives are encouraging. Thank you all for your effort and enthusiasm.

Guerino Mazzola
President, SMCM

## 2. Membership Renewal

This is a gentle reminder to all to renew your society membership. The normal annual individual membership fee is US$50, and includes a print subscription to the Journal of Mathematics and Music (JMM). Issue 5/1 has been published in June, and issue 5/2 in September. Registrations and renewals are processed at the following website: *www.smcm-net.info/registration.html* .

Ian Quinn
Treasurer, SMCM

## 3. The Journal of Mathematics and Music

The Journal of Mathematics and Music is now in its fifth year of production. Because of the high level of interest in the journal, both by readers and by authors, we have increased the page count, beginning in Volume 5. Each issue will now typically include four research articles and a book review. Following a successful panel discussion at MCM 2011 in Paris, we have decided to devote the special issue of Volume 6 to the topic "Mathematical and computational approaches to music: three methodological reflections," guest edited by the panel moderators Anja Volk and Aline Honingh. This issue will feature articles by the panelists, Alan Marsden, Guerino Mazzola and Geraint Wiggins, as well as their responses to one another. As always, please let us know of any problems with journal distribution, especially if you are experiencing any problems receiving your copies. Please also forward to us any feedback you might have on the journal, including your ideas for future special issues.

Robert Peck and Thomas Noll
Co-Editors, *Journal of Mathematics and Music*

## 4. The Society's Next Biennial Conference

The **Fourth International Conference on Mathematics and Computation in Music** (MCM 2013) will be co-hosted by the Schulich School of Music and the Center for Interdisciplinary Research in Music Media and Technology (CIRMMT) at McGill University in Montreal, Canada. The organizing committee comprises of Jonathan Wild, Ichiro Fujinaga, and Christoph Neidhöfer. All are from the Schulich School of Music, Wild and Fujinaga are also affiliated with CIRMMT.

More information on the conference will follow in the next newsletter.

## 5. Review of MCM 2011

This review appears courtesy of Computer Music Journal (published by MIT Press). It will be published, with minor edits, in CMJ 35:4 (Winter 2011).

<div align="right">www.mitpressjournals.org/cmj
www.computermusicjournal.org</div>

### Mathematics and Computation in Music 2011
IRCAM, Paris, France, 15-17 June 2011.

Reviewed by Jordan Smith and Isaac Schankler
Los Angeles, California, USA

The 3rd International Conference on Mathematics and Computation in Music (MCM, mcm2011.ircam.fr) took place from June 15–17, 2011 in Paris, France. Ircam played host, with many of the sessions taking place next door at the Centre Georges Pompidou. The packed program included 9 paper sessions, on topics ranging from Scale Theory to Cognitive Musicology, as well as 2 poster sessions, 2 panel and discussion sessions, and concerts each night after the conference programming. The conference as a whole was deftly organized, with a tight schedule that nonetheless gave enough breathing room to attend Ircam's evening Agora Festival concerts, which showcased a parallel track of artistic and technological innovation.

There were also three keynote addresses. For the first, Pierre Boulez and mathematician and Fields medalist Alain Connes held a discussion, moderated by Gérard Assayag, that touched on many parallels between mathematical and musical work and creation. The wide-ranging conversation was enjoyed by a standing room only crowd. The second keynote was delivered by philosopher Alain Badiou, and mathematician Stephen Wolfram closed the conference with his talk on "Music from the Computational Universe" delivered via videoconferencing in a session chaired by Thomas Noll.

MCM conferences, which take place biennially and alternately in Europe and in North America, enable mathematicians, computer scientists and music scholars to come together and share their perspectives on an interdisciplinary field. However, at this edition, many conference goers and presenters called attention to the divisions that persistently dog this exchange of ideas. Many of these divisions came to the fore at "Around A Geometry of Music," an open panel discussion centred on Dmitri Tymoczko's recent book that featured the author, and was chaired by mathematician Emmanuel Amiot and music theorist Julian Hook (whose preamble provided an excellent overview of mathematical approaches to music theory, from Milton Babbitt up to the present day). The participants spoke of the separation between pure and applied mathematical approaches; between experimental and theoretical approaches; and, repeatedly, between American and continental European approaches. One of Tymoczko's stated goals is to help bridge this divide, and while Amiot seemed to view this as a step in the right direction, he was troubled at times by the lack of explicit formulae or proofs in parts of Tymoczko's book.

Parallel concerns arose at the lively panel discussion the day before, "Bridging the Gap: Computational and Mathematical Approaches in Music Research," featuring Guerino Mazzola, Geraint Wiggins and Alan Marsden, to represent, respectively, mathematical, computational, and traditional approaches to music research. The moderators Anja Volk and Aline Honingh

### MCM 2011 Proceedings
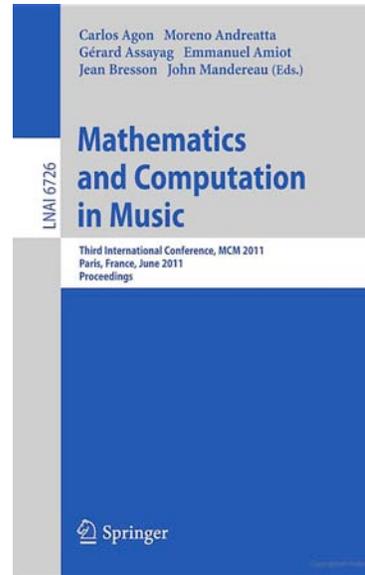
Editors:
Carlos Agon
Moreno Andreatta
Gérard Assayag
Emmanuel Amiot
Jean Bresson
John Mandereau

(incidentally, the only two scheduled female presenters) recalled the historic lack of communication between traditional and computational musicology, but Marsden put forth the possibility that they perhaps ought to be appreciated as separate approaches, both valid and insightful but not intended to be intermingled. He told the audience not to expect or look for a Grand Unified Theory of music, that there would always be multiple ways of understanding, for instance, cadences. Wiggins argued for a cognitive approach to music theory that incorporates an understanding of human perceptual abilities and limitations. Mazzola alone held out hope that the proliferation of musical theories might one day coalesce into a single, coherent set of musical laws, and drew an analogy between the instability of our nascent cultural moment and the instability of physical laws at the beginning of the universe.

All the panelists seemed to agree that bolstering education between disciplines was crucial. Marsden called for less emphasis on scale theory, which dominated the first day of the conference, and for a broadening of scope in the conference program. The final day of the conference offered a glimpse of what this interdisciplinary broadening might look like. For example, Edward Large's paper presentation offered a novel cognitive model of tonality that combined the theoretical lineage of Hemholtz, Fourier and Pythagoras with more recent research on neural resonance and enculturation.

Despite the copious attention devoted to intellectual divisions at the conference, at no point did they seem insurmountable; instead they served to highlight the vibrancy and diversity of the musical-mathematical-computational community. The impassioned and reasoned arguments that peppered the enjoyable panels, keynotes, and coffee breaks of this year's conference were evidence of the urgency and profundity of the issues being addressed. The fourth edition of MCM, in 2013, will no doubt be richer for this exchange of ideas.

## 6. Springer Series on Computational Music Science

Springer has been supporting an increasing number of titles in the series on Computational Music Science, which bodes well for the future of Mathematics-Music research. Some upcoming titles include:

1. Musical Creativity, Strategies and Tools in Composition and Improvisation by Guerino Mazzola, Joomi Park, and Florian Thalmann
2. The Languages of Western Tonality by Eytan Agmon
3. Mathematical Counterpoint Theory by Julien Junod and Octavio Agustin
4. Generalized Concepts of Tonality in Schoenberg's Music by Benedikt Stegemann
5. Debussy and Late-Romantic Performing Practices by Jocelyn Ho
6. Bridging the Gap: Computational and Mathematical Approaches in Music Research by Anja Volk and Aline Honingh (eds.)
7. Computational Musicology in Hindustani Music by Soubhik Chakraborty
8. Tiling Problems in Music by Carlos Agon, Emmanuel Amiot and Moreno Andreatta (eds.)

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**Springer Series on**

**Computational Music Science**

Computational Music Science

Guerino Mazzola
Joomi Park
Florian Thalmann

**Musical Creativity**

Strategies and Tools in Composition and Improvisation
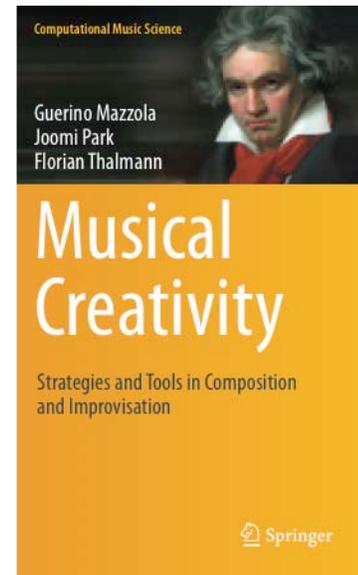
Springer

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### JMM Special Issue

Mathematical and Computational Approaches to Music: three methodological reflections

Anja Volk and Aline Honingh, editors

Both mathematical and computational approaches to music have thrived over the last decades. At the same time, gaps between the different research directions within this multidisciplinary endeavor have been noticed. This special issue discusses possibilities to strengthen the connections between mathematical, computational and musicological approaches to music research for the benefit of all involved disciplines. Following a lively panel discussion with Alan Marsden, Guerino Mazzola and Geraint Wiggins at the 3rd International Conference on Mathematics and Computation in Music (MCM 2011), this issue presents methodological reflections of the three panelists on achievements, failures, challenges, and perspectives of mathematical and computational approaches to musc research. Each of the three original articles, based on questions posed by Anja Volk and Aline Honingh during the panel discussion, will be commented upon in response articles by the other panelists in order to capture competing points of view. Thus, the special issue will present controversial perspectives on the contribution of mathematical and computational approaches to music research, hopefully stimulating a broad debate on these issues within the growing community of interdisciplinary music research.

9. Algebraic Methods in 20th Century Music and Musicology by Moreno Andreatta

Guerino Mazzola and Moreno Andreatta
Co-Editors, *Computational Music Science*
*www.springer.com/series/8349*

### 7. Noteworthy News

2011 marks the **10th anniversary of the MaMuX seminars** (MaMuX = Mathematics/Music and relations to other fields), a monthly seminar based at Ircam that played a major role in the institutionalization of our research field. Information on the new season 2011-2012 (the 11th one) can be found online at *repmus.ircam.fr/mamux/home*. Interested people should contact the new organizers, John Mandereau and Jean Bresson, if they wish to propose topics for the sessions that have yet to be planned.

Elaine **Chew** and **Alexandre François**, with collaborators **Peter Child** and **Aniruddh Patel** presented "Musical Patois – reflections of language in music," an event featuring scientific presentation, software demonstration, musical discussion, and premiere of piano pieces centered on Patel, Iversen, and Rosenberg's finding that instrumental music of British and French composers reflects the rhythm and intonation of their native tongue, at the MIT Festival of Arts, Science, and Technology, and at the USC Visions and Voices series in March 2011. As synergistic activity leading up to the event, Chew and François co-organized a Radcliffe Institute for Advanced Study Exploratory Seminar on "Prosody and Dialog in Language and Music" in November 2010.

# SMCM Member Publications
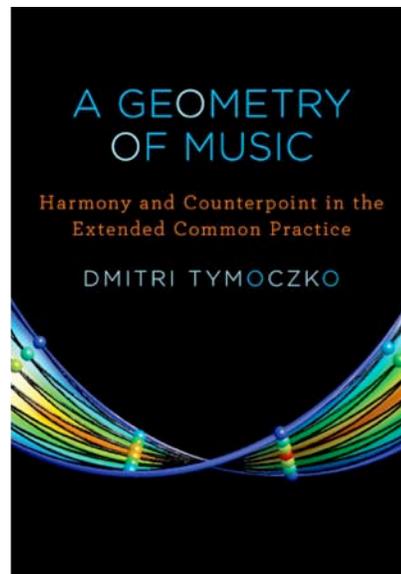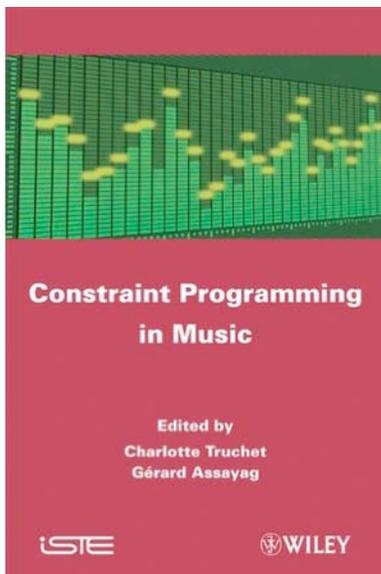




Members **Thomas M. Fiore** and **Ramon Satyendra** and co-author **Alissa Crans** received the 2011 Merten M. Hasse Prize of the Mathematical Association of America for their joint article "Musical Actions of Dihedral Groups." The article appeared in the American Mathematical Monthly.

**Eleri Pound** has been awarded a Leverhulme Trust Artist in Residence award for 10 months (February to December 2011) to work in the School of Mathematics at the University of Leeds. During the project she will be collaborating with the department, composing four pieces exploring different mathematical concepts, particularly certain aspects of chaos theory, as well as creating displays, exhibitions and a website explaining the work.

**Charlotte Truchet** and **Gérard Assayag** have edited a volume titled "Constraint Programming in Music," which has been published by Wiley in April 2011. The book presents information about recently developed musical Constraint Programming systems, from both the scientific and music compositional points of view.

**Dmitri Tymoczko** published "A Geometry of Music" with Oxford University Press, and "Beat Therapy" with Bridge Records. Tymoczko and **Godfried Toussaint** arranged a workshop in mathematics and music at the Bellairs Institute, Holetown, Barbados, in February 2011. **Rachel Hall** and Tymoczko had an article accepted by the American Mathematical Monthly, "Submajorization and the Geometry of Unordered Collections," which explores relationships between music, economics, and other disciplines modeling unordered sets.

**Anja Volk** was awarded a highly prestigious NWO-VIDI-grant from the Netherlands organization for Scientific research within its Innovational Research Incentives Scheme in November 2010. The scheme is directed at providing encouragement for individual researchers and gives talented, creative researchers the opportunity to conduct their own research programme independently and promote talented researchers to enter and remain committed to the scientific profession. Volk's VIDI-project "Modelling musical similarity over time through the variation principle" is an interdisciplinary project comprising Music Information Retrieval, Musicology and Cognition. In March 2011, Anja Volk was appointed as assistant professor at the Department of Information and Computing Sciences at Utrecht University.

## About Us

The Society for Mathematics and Computation in Music (SMCM) was founded in 2006 as an international forum for researchers and musicians working in the trans-disciplinary field at the intersection of music, mathematics and computation. The SMCM is registered in the USA. At its inaugural meeting in Berlin, on May 20, 2007, 13 board members were elected, from which were selected the officers for the society. The official website of the Society can be found at *www.smcm-net.info*.

To become an accredited individual SMCM member, please visit our online registration form at *www.smcm-net.info/registration.html*. Membership includes a print subscription to the Journal of Mathematics and Music, the SMCM's official journal. For full information on the Journal of Mathematics and Music, a publication by Taylor & Francis, including manuscript submission instructions, library subscription options, details on free email alerting services, editorial board information and the online edition, please visit its homepage at *www.informaworld.com/JMM* .